Worksheet 3 Types of processor

Task 1

1. Using standard von Neumann architecture, instructions and data both share the same memory space.

Memory	
Address	**Instruction / Data**
0	10010111 00101111
1	
2	00000000 11010100
…	…
255	00000000 01001010

One problem with this model is that the CPU can either be reading an instruction or reading/writing data to or from memory, but not both at the same time since instructions and data use the same bus system, which is a performance limitation.

(a) Name another architecture that resolves this issue. How does it differ from von Neumann architecture?

(b) What other advantages are there of using this architecture?

(c) What are the advantages of von Neumann architecture over Harvard architecture?

2. Complete the following text by using the words an phrases given below to fill in the gaps.

CISC stands for _____. In this technology, the _____ consists of a _____ number of instructions, each designed to execute a series of _____ that make up a single _____. Because the code is relatively _____, _____RAM is needed to store the instructions.

_____ stands for Reduced Instruction Set Computer. This type of computer uses a _____ instruction set, and each instruction can be performed in one _____. This means that _____ is possible, and _____ is at least as good or better than CISC.

Cheap _____ has contributed to the prevalence of this technology in almost all modern desktop computers.

pipelining short large clock cycle performance very little sub-tasks instruction instruction set Complex Instruction Set Computer small RAM RISC

Task 2

Compare co-processor and parallel processor systems. (Note that “compare” means describe similarities and differences.)